

19. Explain in detail the etching process using an etching machine and the safety precautions required.
20. Describe the process of automated artwork drafting in PCB design highlighting CAD software advantages.

NOVEMBER/DECEMBER 2025

**23USEL33 — PCB DESIGN AND
FABRICATION (SEC IV)**

Time : Three hours

Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

1. Define a single-sided PCB.
2. List any two surface mount components.
3. What is conductor spacing in PCB layout?
4. Define layout planning in PCB design.
5. Name two types of laminates used in PCBs.
6. What is a dry film resist?
7. Give details of etchant in PCB etching.
8. List any two soldering fluxes.
9. What is crosstalk in PCB design?
10. Define CAD in the context of PCB design.

SECTION B — ($5 \times 5 = 25$ marks)

Answer ALL questions.

11. (a) Explain the advantages and limitations of Surface Mount Technology (SMT).

Or

- (b) Differentiate between single-sided and double-sided PCBs with examples.

12. (a) Describe the general rules for placing components during PCB layout.

Or

- (b) Explain the importance of supply and ground conductors in circuit layout.

13. (a) Give explanation the process of manually cleaning copper-clad laminates before artwork.

Or

- (b) Describe the basic printing process for double-sided PCBs.

14. (a) Differentiate between soldering and desoldering tools.

Or

- (b) Describe the principles of a good solder connection.

15. (a) Discuss how ground and supply line noise can affect PCB performance.

Or

- (b) Mention the importance of design rules in automated PCB drafting.

SECTION C — ($3 \times 10 = 30$ marks)

Answer any THREE questions.

16. Describe various plated through hole technologies and their significance in PCB design.
17. Provide a detailed procedure for complete layout planning, including layout check and artwork approaches.
18. Compare photo resists and wet film resists, stating their advantages and applications in PCB fabrication.

